California Division of Mines and Geology

Fault Evaluation Report FER-1

1. Name of fault. Unnamed secondary fault traces west of San Andreas fault zone.

2. Location of fault. Bodega Head quadrangle, Sonoma County. Fault in question cuts across Horseshoe Cove in vicinity of U.C. Marine Biology Research Station. Also, three other faults in the area are evaluated.

3. Reason for evaluation. The office of Architecture and Construction has requested (on 11/22/74) this revision, based on a consulting report by Woodward-Lundgren Associates.

4. List of references.

a. Huffman, M.E., 1973, Geology for planning along the Sonoma County coast between the Russian River and Estero Americano: California Division of Mines and Geology, Preliminary Report 20.

b. Koenig, J.G., 1963, The geologic setting of Bodega Head: California Division of Mines and Geology, Mineral Information Service, v. 16, No. 7, p. 1-10.

c. Woodward-Lundgren Associates, 1974, Evaluation of potential for surface fault displacement, University of California Marine Biology Research Station, Bodega Bay, California (copy in informal A-P file).

d. Bonilla and Schlocker, 1963, Engineering geologic evaluation of Bodega Head nuclear site, prepared for U.S. Atomic Energy Commission by U.S. Geological Survey (in DMG Library).

e. Slosson, J.E., 1974, Special Studies Zones, Bodega Head quadrangle, Official Map of the State Geologist.

5. Summary of available data. (See Plate 1 for location of faults.)

I. Fault A-B is shown by Koenig to be 1500' long and striking N 42° W. Koenig's data for late Pleistocene movement on A-B is "soft" as the contact between terrace materials and quartz diorite could be (and indeed appears to be) depositional.

II. Fault E is shown by Koenig to be approximately one mile long and striking N 44° W. Koenig shows fault E to cut Quaternary sand dunes; while Huffman shows this fault to be the contact between late Pleistocene terrace materials and Holocene sand dunes. Huffman also states that this fault is believed to be the westernmost trace of the San Andreas system.

III. Koenig indicates fault D is about 3000' long and strikes N 50° W. Koenig shows this fault to be right lateral(?) on his geologic map with terrace deposits faulted against quartz diorite. This is "hard" Quaternary evidence; however, no Holocene movement is indicated.

IV. Bonilla and Schlocker show fault G (also called the Shaft fault) to be 750' long and striking N 30° E. This fault was not known to exist until the shaft was excavated and has no surface expression. They indicate that the oldest unfaulted material has been dated at 42,000 B.P.

6. Interpretation of air photos. Air photos were borrowed from Woodward-Lundgren Associates, project geologists for this site. Scale of photos 1" = 500'.

a) Fault A-B shows no evidence of surface faulting. Only a NW-trending set of joints in the quartz diorite can be seen.

b) Fault at E is a well-defined, linear feature, scarp-like in appearance.

c) The Shaft fault, G, shows no evidence of surface faulting.

d) Fault at D not covered by air photos.

7. Field observations -- January 29, 1976.

a) No evidence of faulting was observed in the well-exposed terrace deposits at AB (see Figure 1 attached). The possibility exists that there is a fault here, but only in bedrock, not in the overlying terraces. However, no evidence other than a set of NW trending joints was observed.

b) Saw no evidence of a fault in quartz diorite cliffs at D. Area SW of G has been excavated, so any fault evidence has been covered over.

c) Fault scarp E was observed in the field, however, no recent evidence of movement was seen (i.e. cracks, sags, other recent geomorphic features). The possibility that sand was blown up against terrace deposits is another explanation for this feature.

8. Conclusions:

a) Fault AB shows no evidence of Quaternary displacement. The late Pleistocene terrace deposits are not faulted.

b) Fault D can be shown to be late Pleistocene (Koenig) but no Holocene evidence is shown by other workers.

c) Fault E is probably Holocene, because dune sands apparently are in fault contact with terrace deposits.

d) The Shaft fault, G, was not active during Holocene. Bonilla and Schlocker show the oldest unfaulted unit as 42,000 B.P.

9. Recommendations:

a) Remove fault AB from Special Studies Zones map (*Figure 2*).

b) Remove shaft fault, G.

c) Change zone to a tighter zone around fault E and another tight zone around D. These faults seem well enough located to warrent this tightening.

10. Investigating geologist's name; date.

Edward J. Bortugno
2/23/76

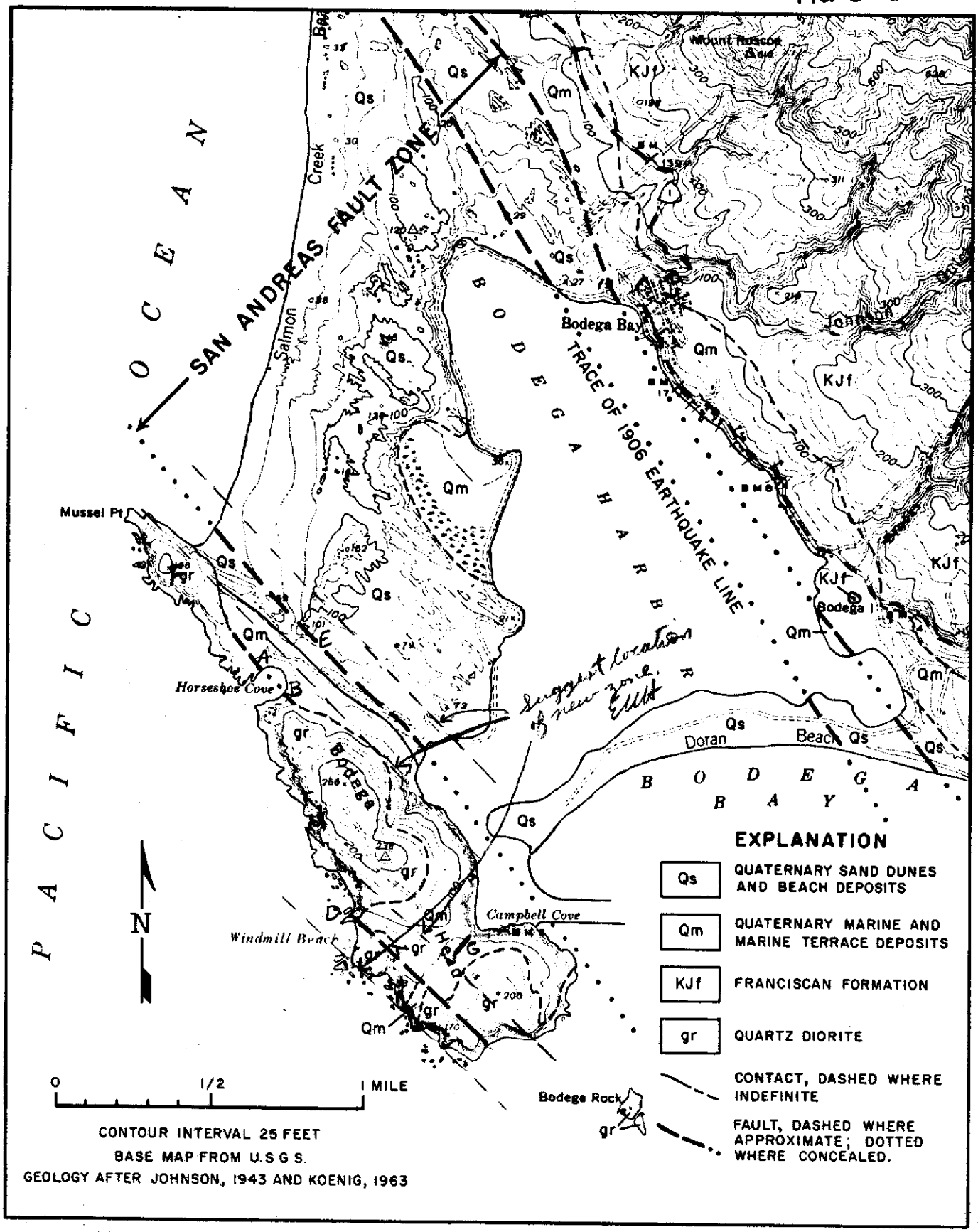
Edward J Bortugno

Review Comments

Rezone when San Andreas fault re-evaluated under 10-year program (about 1980), unless need to rezone arises sooner. Faults A-B and G should be deleted, based on this evaluation. Fault D needs further investigation prior to deletion and fault E should be retained (evidence of Holocene or late Pleistocene faulting). Suggested new zone boundaries are shown on fig. 2. Fault G and other faults in ~~552~~ map area should be reevaluated prior to rezoning this map.

Earl W. Hart
4/7/76

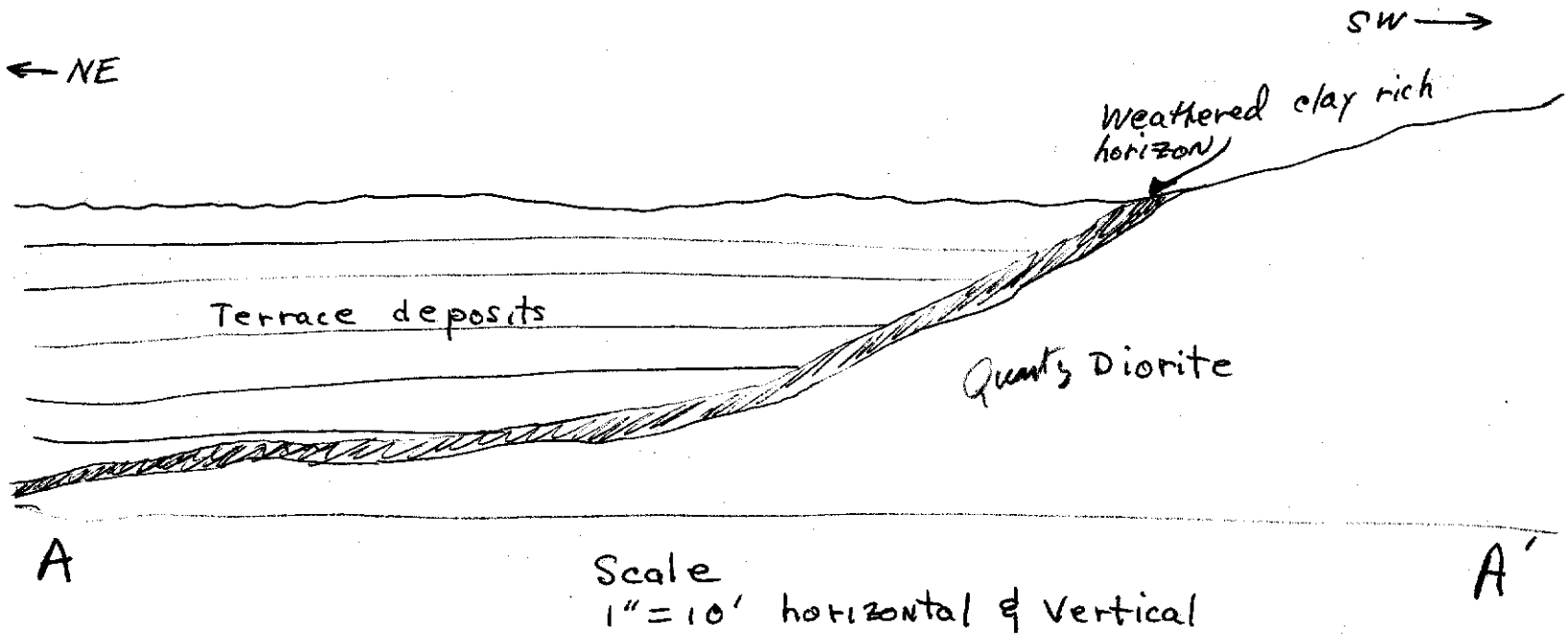
Plate 1



Geologic map of Bodega Head, Sonoma County, showing San Andreas Fault zone.

Copied from Koenig (1963).

Fig. 1



Scale
1" = 10' horizontal & Vertical

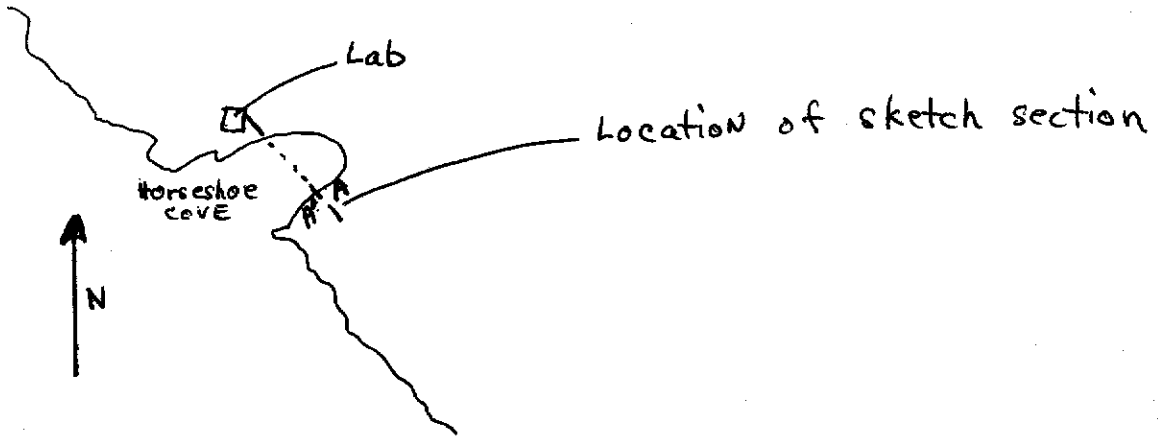


FIG. 2

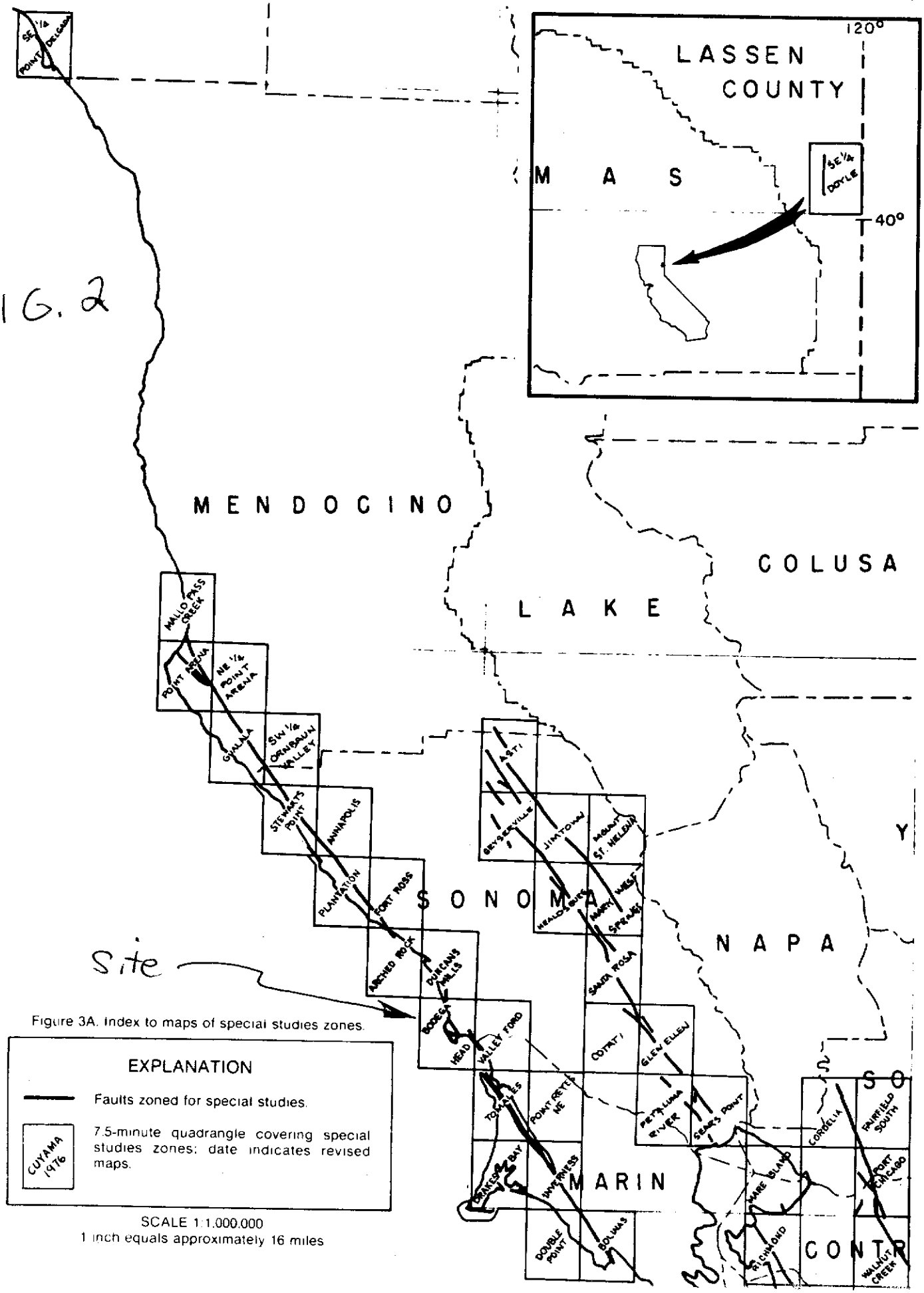


Figure 3A. Index to maps of special studies zones.

EXPLANATION

Faults zoned for special studies.

CUYAMA 1976 — 7.5-minute quadrangle covering special studies zones; date indicates revised maps.

SCALE 1:1,000,000
1 inch equals approximately 16 miles